**DRAFT**

# Corrective Action Decision




## Van Waters & Rogers-South (NIC) Site
## WICHITA, Kansas

DRAFT: JULY 2014

Kansas Department of Health and Environment
Environmental Remediation

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## ACRONYMS AND ABBREVIATIONS USED IN THIS DOCUMENT

| | |
|---|---|
| ARARs | Applicable or Relevant and Appropriate Requirements |
| AST | Above-ground Storage Tank |
| ATG | Alternate Treatment Goal(s) |
| bgs | Below Ground Surface |
| CAD | Corrective Action Decision |
| COC | Contaminants of Concern |
| EPA | United States Environmental Protection Agency |
| ERM | Environmental Resources Management |
| EUC | Environmental Use Control |
| FS | Feasibility Study |
| KDHE | Kansas Department of Health and Environment |
| MCL | Maximum Contaminant Level |
| mg/kg | Milligrams per Kilogram |
| NCP | National Oil and Hazardous Substances Pollution Contingency Plan |
| NIC | North Industrial Corridor Site |
| OSHA | Occupational Safety and Health Administration |
| PCE | Tetrachloroethene |
| RAO | Remedial Action Objective |
| RI | Remedial Investigation |
| RSK | Risk-based Standards for Kansas |
| TCE | Trichloroethene |
| TM | Technical Memorandum |
| VI | Vapor Intrusion |
| VOCs | Volatile Organic Compounds |
| µg/kg | Micrograms per Kilogram |
| µg/L | Micrograms per Liter |

# GLOSSARY

**Administrative Record** – The body of documents that forms the basis for selection of a particular response at a site. Parts of the Administrative Record are available in an information repository near the site to permit interested individuals to review the documents and to allow meaningful participation in the remedy selection process.

**Aquifer** – An underground layer of rock, sand, or gravel capable of storing water within cracks and pore spaces or between grains. When water contained within an aquifer is of sufficient quantity and quality, it can be used for drinking or other purposes. The water contained in the aquifer is called groundwater.

**Applicable or Relevant and Appropriate Requirements (ARARs)** – The federal and state environmental laws that a remedy will meet. These requirements may vary among sites and alternatives.

**Capital Costs** – Expenses associated with the initial construction of a project.

**Corrective Action Decision (CAD)** – The decision document in which KDHE selects the remedy and explains the basis for selection for a site.

**Exposure -** Contact made between a chemical, physical, or biological agent and the outer boundary of an organism. Exposure is quantified as the amount of an agent available at the exchange boundaries of the organism (e.g., skin, lungs, gut).

**Feasibility Study (FS)** – A study conducted to evaluate alternatives for cleanup of contamination.

**Groundwater** – Underground water that fills pores in soils or openings in rocks to the point of saturation. Groundwater is often used as a source of drinking water via municipal or domestic wells.

**Maximum Contaminant Levels (MCLs)** – The maximum permissible level of a contaminant in water that is delivered to any user of a public water system.

**Monitoring** – Ongoing collection of information about the environment that helps gauge the effectiveness of a cleanup action. For example, monitoring wells drilled to different depths at the site would be used to detect any downward migration of the plume.

**Monitored Natural Attenuation** - Allowing natural processes to remediate pollution in soil and groundwater while site conditions are routinely monitored.

**National Oil and Hazardous Substances Pollution Contingency Plan (NCP)** – The federal regulations that guide the Superfund program. These regulations can be found at 40 Code of Federal Regulations, Part 300.

**Plume** – A body of contaminated groundwater flowing from a specific source.

**Remedial Investigation (RI)** - A study of the source, nature, and extent of contamination.

**Risk** - The probability of adverse health effects resulting from exposure to an environmental agent or mixture of agents.

**Tier 2 Level –** Calculated risk-based cleanup value for a specific contaminant. These values can be found in Appendix A of the *Risk-Based Standards for Kansas (RSK) Manual.*

**Threshold** - The dose or exposure below which no harmful effect is expected to occur.

**Toxicity** – A measure of degree to which a substance is harmful to human and animal life.

**Vapor Intrusion –** The migration of contaminants from the subsurface into overlying and/or adjacent buildings.

**Volatile Organic Compounds (VOCs)** – Carbon compounds, such as solvents, which readily volatilize at room temperature and atmospheric pressure. Most are not readily dissolved in water, but their solubility is above health-based standards for potable use. Some VOCs can cause cancer.

## 1. Purpose of the Draft Corrective Action Decision

The primary purposes of the draft Corrective Action Decision (CAD) for the Univar Mosley Avenue Facility (Univar), also known in the Kansas Department of Health and Environment (KDHE) Administrative File information as the Van Waters and Rogers - South site, are to: 1) summarize information from key site documents including the Revised Remedial Investigation (RI)[1], Technical Memorandum and Data Report (TM)[2], and Feasibility Study[3] (FS) reports; 2) briefly describe the alternative remedies for addressing groundwater contamination detailed in the RI, TM, and FS report(s); 3) identify and describe the KDHE preferred remedy; and 4) provide an opportunity for public comment on the preferred remedy.

KDHE will select a final remedy after reviewing and considering all information submitted during the 45-day public comment period. KDHE may modify the preferred remedial alternative based on new information or public comments. Therefore, the public is encouraged to review and comment on the preferred remedy presented in this draft CAD. KDHE will hold a public availability session during the public comment period to present information regarding the preferred remedy and solicit public participation. The public may submit written comments to KDHE during the public comment period (July 1, 2014 through August 15, 2014). Section 9.0 describes how to provide comments on the draft CAD.

Various environmental consultants on behalf of Univar have performed certain RI/FS tasks required by Consent Order, Case No. 98-E-0096. The public is encouraged to review and comment on the technical information presented in the RI, TM, and FS reports and other documents contained in the Administrative Record file. The Administrative Record file includes all pertinent documents and site information that form the basis and

### Highlight 1-1: Public Information

*Administrative Record File*

Kansas Department of Health and Environment
Bureau of Environmental Remediation
1000 SW Jackson Street; Suite 410
Topeka, Kansas 66612-1367

Contact: John K. Cook, PG
Phone: (785) 296-8986
E-mail: johncook@kdheks.gov
Web:
http://www.kdheks.gov/remedial/site_restoration/van_waters.html

*Local Information Repository*

City of Wichita Department of Public Works and Utilities
Environmental Health Division
1900 E. Ninth Street
Wichita, Kansas 67214
Contact: Shawn Maloney
Phone: 316-268-8351



[1] Secor International Incorporated, 2005, *Revised Remedial Investigation Report, Former Van Waters & Rogers Facility, Mosely Avenue Facility, Wichita, Kansas, North Mosley site, Wichita, Kansas*, March 2005
[2] *ibid.*
[3] ERM, 2014, *Feasibility Study Report, North Mosley site, Wichita, Kansas*, finalized and approved, April 2014.

rationale for selection of the final remedy. The KDHE Administrative Record file is available for public review during normal business hours at the locations shown in Highlight 1-1.

## 2. SITE BACKGROUND

### 2.1 Site Location

The Univar facility is located at 2041 North Mosley Avenue in the central part of the City of Wichita, Sedgwick County, Kansas (Fig 1).[4] The Univar facility is situated within the North Industrial Corridor (NIC), an area of mixed industrial, commercial, residential, recreational, and agricultural properties located in north-central Wichita, Kansas[5]. The NIC is an approximately 10-square mile site and is subject to ongoing investigation and remediation of groundwater and soil contamination.[6,7] A long history of industrialization throughout the NIC, including the Univar facility, has left a legacy of volatile organic compound (VOC) contamination in groundwater and soil, including chlorinated solvents such as tetrachloroethene (PCE), and trichloroethene (TCE); petroleum hydrocarbon-related contaminants; heavy metals; and other contaminants of concern (COC).[8] The NIC is divided into several groundwater units with the Univar facility located in Groundwater Unit No. 2.[9] The facility occupies a square-shaped lot, approximately two acres in size, that is mostly concrete-covered and includes a 20,000 square-foot warehouse building.[10,11] Figure 2 shows the current site layout with an approximated property boundary. The facility property boundary will be verified in a legal survey conducted as part of the development of the Environmental Use Control (EUC) application.

### 2.2 Site Setting

The Univar facility is surrounded by industrial and commercial properties. The adjacent properties include a commercial building with associated open storage to the north, a warehouse/open storage area to the east, a farm/ranch feed supply to the south and an open field and storage to the west. There are railroad tracks immediately to the west and adjoining the Univar facility.



[4] United States Geological Survey, East Wichita Quadrangle, Photo-revised 1982, 1:24,000, 7.5 Minute Series, Reston, VA, United States Department of the Interior, USGS, 1982
[5] KDHE, *2012, Final Corrective Action Decision for Interim Groundwater Remediation, North Industrial Corridor Site, Wichita, Kansas, March 2012*
[6] Secor International Incorporated, *2005, Revised Remedial Investigation Report, Former Van Waters & Rogers Facility, Mosely Avenue Facility, Wichita, Kansas, North Mosley site, Wichita, Kansas, March 2005.*
[7] KDHE, *2012, Final Corrective Action Decision for Interim Groundwater Remediation, North Industrial Corridor Site, Wichita, Kansas, March 2012*
[8] *ibid.*
[9] *ibid.*
[10] Secor International Incorporated, 2005, *Revised Remedial Investigation Report, Former Van Waters & Rogers Facility, Mosely Avenue Facility, Wichita, Kansas, North Mosley site, Wichita, Kansas, March 2005*.
[11] ERM, 2014, *Feasibility Study Report, North Mosley site, Wichita, Kansas*, finalized and approved, April 2014.

### 2.3 Site History

Univar has owned and operated the facility as a chemical distribution center since 1986.[12] Univar no longer manufactures or blends any chemicals at this location. All chemical products currently received from manufacturers are stored in their original containers for eventual sale and/or shipment to local clientele.[13]

Univar handles a wide variety of commercial and industrial chemicals in both liquid and dry forms, including drummed solvents/corrosives and a limited amount of pest control products that arrive at the facility containerized in bags and/or boxes.[14] Empty drums are stored on the southeast corner of the facility, adjacent to the former diesel underground storage tank. Univar no longer washes or rinses any drums at the facility.[15]

Since around 1952, before Univar ownership, the site has been used for chemical distribution and intermittent chemical repackaging. Operations by the former facility owner/operator (Van Waters & Rogers) included repackaging mineral acids, caustics and solvents.[16] In 1977 two aboveground storage tanks (ASTs) were installed by Van Waters & Rogers in the southeast corner of the facility on top of a concrete pad surrounded by a concrete dike/wall acting as secondary containment. These tanks were adjacent to a concrete building containing the repackaging module.[17] Bulk liquid chemicals including various solvents and hydrochloric acid were repackaged and dispensed from either of these two ASTs via fixed piping and/or from flexible hoses from tanker cars (either railroad cars or trucks). All solvent repackaging ended in 1990 and caustic repackaging ceased in 1992.[18] The ASTs and secondary containment structures were also removed by Univar in 1992.[19]

The small repackaging building located next to the ASTs contained a drum wash area used for washing out the poly drums that previously contained corrosive materials. The drum rinse water drained into a 1,500 gallon, in-ground, poly-vinyl chloride lined neutralization tank located a "few feet"[20] outside the repacking module. During operation approximately 900 gallons of drum rinse water was discharged every two weeks into the sanitary sewer system after pH adjustment,.[21]



[12] ERM 2014, *Feasibility Study Report, North Mosley site, Wichita, Kansas*, finalized and approved, April 2014.
[13] *ibid.*
[14] *ibid.*
[15] *ibid.*
[16] Secor International Incorporated, 2005, *Revised Remedial Investigation Report, Former Van Waters & Rogers Facility, Mosely Avenue Facility, Wichita, Kansas, North Mosley site, Wichita, Kansas*, March 2005.
[17] *ibid.*
[18] ERM 2014, *Feasibility Study Report, North Mosley site, Wichita, Kansas*, finalized and approved, April 2014.
[19] *ibid.*
[20] Secor International Incorporated, 2005, *Revised Remedial Investigation Report, Former Van Waters & Rogers Facility, Mosely Avenue Facility, Wichita, Kansas, North Mosley site, Wichita, Kansas*, March 2005.
[21] *ibid.*

In July 1984 a release of approximately 375 gallons of TCE into the dike area of the ASTs was reported. The released material was reportedly fully contained within the dike area and completely removed with no reported loss of product.[22] In July 1986 another release of approximately 75 gallons of TCE occurred, again into the dike area around the bulk TCE AST. All material released reportedly was contained and recovered.[23]

To date, there have been no known additional releases of TCE (or other solvents) identified at the facility. However, Univar notes other minor releases have been reported at the facility including: 1989 (hydrofluoric acid); 1990 (sulfur dioxide and sodium hydroxide); and, 1991 (caustic soda and hydrochloric acid). All releases were reportedly fully contained and mitigated.[24]

# 3. Remedial Investigation

## 3.1. Previous Investigations

Several phases of RI activities have been conducted to date; associated reports are included in the Administrative Record. These activities included soil and groundwater investigation, a simplified vapor intrusion assessment, and development of a simplified risk assessment. Objectives for the RI included:

- Characterizing potential source areas and evaluating appropriate cleanup goals (i.e., the type and nature of contaminant source(s), the cause of release(s), estimated quantity of release(s), and if the release(s) is/are active or inactive);
- Characterizing the vertical and horizontal extent of contamination (including migration mechanisms) to support developing and evaluating effective remedial alternatives;
- Characterizing the chemical and physical properties of the contaminants, their mobility and persistence in the environment, and their important fate and transport mechanisms; and
- Identifying human and environmental targets that may be affected by contamination.

### 3.1.1 Soil Investigations

The phased RI activities document that the Univar facility is underlain by alluvial sediments including shallow and deep zones. The shallow zone typically consists of silty-sands, sandy-silts, and fine sands that extend to depths of approximately 20 to 25 feet below ground surface



[22] Secor International Incorporated, 2005, *Revised Remedial Investigation Report, Former Van Waters & Rogers Facility, Mosely Avenue Facility, Wichita, Kansas, North Mosley site, Wichita, Kansas*, March 2005
[23] *ibid.*
[24] i*bid.*

(bgs).[25] The deep zone typically consists of a general coarsening downward sequence of silty-sand to fine gravel beginning at depths of approximately 20 to 30 feet bgs. The deep zone extends to the underlying bedrock interface at depths of approximately 40 to 45 feet bgs.[26] Laterally discontinuous lenses of silt and clay of various thicknesses were encountered at depths ranging from approximately 20 to 28 feet bgs.[27] Where present, these discontinuous lenses correspond to the transition from the shallow to the deep zones of the alluvial sediments. In the absence of the lenses, the shallow to deep zone transition was typically identified by a noticeable change in sediments; a sequence of sandy-silts and silts overlying coarse sands to fine gravels.[28]

Initial soil sample collection occurred in 1990.[29] Five soil samples were collected and analyzed for six compounds known to be handled at the facility.[30] TCE was the only compound detected above analytical detection limits and was present in four of the five samples at concentrations ranging between 0.024 and 0.127 milligrams per kilogram (mg/kg).[31] The current KDHE *Risk-based Standards for Kansas* (RSK), *RSK Manual, 5th Version*, Tier 2 Residential screening criteria for soil and soil to groundwater are 5.85 mg/kg and 0.0842 mg/kg respectively[32].

RI soil data from samples collected in 1998 found no evidence of impacts (based on KDHE 1998 screening criteria)[33]. However, in order to more adequately characterize the nature/extent and fate/transport of potential COCs and their impacts, Univar collected in 1998 additional soil samples for chemical analysis. The added soil sample collection locations were biased toward areas presumed most likely to be impacted.[34] The analytical data reported no concentrations above analytical detection limits.[35] Univar performed a third soil sample collection event in 2005 and again collected samples from areas presumed likely to be impacted. One sample exceeded the current KDHE RSK Tier 2 screening criteria.[36,37] This soil sample was collected from location MW-3D along the northern portion of the site (Fig 2) from a depth of between 1 and 3 feet bgs and had a reported TCE concentration of 0.150 mg/kg. The KDHE Tier 2 soil to groundwater screening level is 0.0842 mg/kg.[38]



[25] Secor International Incorporated, 2005, *Revised Remedial Investigation Report, Former Van Waters & Rogers Facility, Mosely Avenue Facility, Wichita, Kansas, North Mosley site, Wichita, Kansas*, March 2005.
[26] *ibid.*
[27] *ibid.*
[28] *ibid.*
[29] Geraghty & Miller, Inc., 1991, *Soil Boring Investigation Report, Van Waters & Rogers, Inc., 2041 N. Mosley Avenue, Wichita, Kansas,* March 1991.
[30] *ibid.*
[31] *ibid.*
[32] Risk-Based Standards for Kansas, RSK Manual, 5th Version, October 2010, Revised Appendix A March 2014
[33] Secor International Incorporated, 2005, *Revised Remedial Investigation Report, Former Van Waters & Rogers Facility, Mosely Avenue Facility, Wichita, Kansas, North Mosley site, Wichita, Kansas*, March 2005
[34] *ibid.*
[35] *ibid.*
[36] *ibid.*
[37] *Risk-Based Standards for Kansas, RSK Manual, 5th Version, October 2010*, Revised Appendix A March 2014.
[38] *ibid.*

Table 1 shows the maximum soil concentration for COCs along with the KDHE RSK Tier 2 screening values. Comparing the RI targeted soil data to the RSK Tier 2 [residential] screening levels shows that contaminant concentrations are generally orders of magnitude lower than the KDHE residential cleanup values.

### 3.1.2 Hydrogeologic Investigations

The Univar groundwater investigation included installation and sampling of 10 groundwater monitoring well nests, each consisting of a shallow and a deep well for a total of 20 wells.[39] Groundwater is present at depths ranging from 11 to 16 feet bgs in both the shallow and the deep monitoring wells.[40] During the installation of the deep monitoring wells, several relatively thin and laterally discontinuous lenses of silty-clay to clay were encountered at approximately 20 to 28 feet bgs.[41] Groundwater measurements for the shallow and deep zone monitoring wells exhibit relatively similar potentiometric surface elevations, indicating that the laterally discontinuous silty-clay to clay lenses do not result in a hydraulic separation between the shallow and deep zones of the aquifer.[42] Groundwater flow at the Univar facility is consistent with the overall regional flow as observed within the NIC and is generally to the south and southeast.[43]

There have been 14 rounds of groundwater sample collection and analysis between 1998 and 2013. Initially, a broad range of VOCs was detected above analytical detection limits including 1,1-dichloroethane, 1,1-dichloroethylene, cis-1,2-dichloroethylene, trans-1,2-dichloroethylene, TCE, vinyl chloride, and PCE. Historically TCE is the most frequently detected parameter above its RSK Tier 2 screening level of 0.005 mg/L. PCE was less frequently detected above its RSK Tier 2 screening level of 0.005 mg/L, primarily in well MW-6s. Analytical results from the seven most recent sampling events for MW-6s show detections for COCs, including PCE, below RSK Tier 2 screening levels.

Historical VOC concentrations from the remaining groundwater monitoring wells at the Univar facility have decreased by orders of magnitude since first identified in 1998 and are presumed to have attenuated over time primarily due to mechanical processes (e.g. dispersion and dilution); reductive dechlorination by biological process has not been proven to occur. As currently observed groundwater samples from five of the Univar groundwater monitoring wells do not exceed drinking water standards (Maximum Contaminant Levels (MCLs) and/or KDHE Tier 2 Risk-based Screening Criteria).[44] The remaining well data report VOC concentrations within 1 to 28 µg/L of meeting drinking water quality standards.[45] Table 2 shows the maximum

[39] ERM, 2014, *Feasibility Study Report, North Mosley site, Wichita, Kansas*, finalized and approved, April 2014.
[40] Secor International Incorporated, 2005, *Revised Remedial Investigation Report, Former Van Waters & Rogers Facility, Mosely Avenue Facility, Wichita, Kansas, North Mosley site, Wichita, Kansas*, March 2005.
[41] *ibid.*
[42] *ibid.*
[43] KDHE, 2012, *Final Corrective Action Decision for Interim Groundwater Remediation, North Industrial Corridor Site, Wichita, Kansas*, March 2012.
[44] ERM, 2014, *Feasibility Study Report, North Mosley site, Wichita, Kansas*, finalized and approved, April 2014.
[45] *ibid.*

contaminant concentration identified in onsite wells along with the most recent analytical data (Feb 2013) (figs. 3 and 4).[46]

Of particular note, analytical results from NIC groundwater investigation activities for areas surrounding the Univar facility show that the groundwater VOC concentrations for locations hydraulically upgradient from Univar, in both the shallow and deep zones, have higher concentrations than those observed on Univar facility property.[47] [48] Generally contaminant concentrations in onsite groundwater are similar to those observed at side-gradient and downgradient properties.[49] Data from monitoring well nests MW-8 and MW-9, immediately hydraulically downgradient of the former [Univar] ASTs, do not suggest the Univar facility is a significant current and continuing source of VOCs.[50]

### 3.2 Nature and Extent of Soil and Groundwater Contamination

Based on the previous investigation results, the various soil and groundwater data do not indicate that the Univar facility continues to contribute contamination to the VOCs identified in groundwater. Shallow and deep groundwater VOC concentrations from upgradient offsite locations have typically been higher than across the Univar facility over time, and downgradient offsite concentrations have typically been lower.[51] [52]

### 3.3 Vapor Intrusion Assessment

During the NIC remedial investigation, CDM Smith, Inc. (CDM) evaluated the potential for vapor intrusion (VI) from the subsurface to indoor air.[53,54] Separately, limited VI assessments efforts were conducted on a NIC source-area specific basis by others, including KDHE.[55] In concert with these NIC efforts, since VI was considered a potentially completed exposure pathway at the Univar facility, further site specific evaluation efforts were conducted.[56] This evaluation involved assessing site conditions along with a separate comparison of data to



[46] ERM, 2014, *Feasibility Study Report, North Mosley site, Wichita, Kansas*, finalized and approved, April 2014
[47] KDHE, 2012, *Final Corrective Action Decision for Interim Groundwater Remediation, North Industrial Corridor Site, Wichita, Kansas*, March 2012.
[48] Secor International Incorporated, 2005, *Revised Remedial Investigation Report, Former Van Waters & Rogers Facility, Mosely Avenue Facility, Wichita, Kansas, North Mosley site, Wichita, Kansas*, March 2005.
[49] *ibid.*
[50] *ibid.*
[51] KDHE, 2012, *Final Corrective Action Decision for Interim Groundwater Remediation, North Industrial Corridor Site, Wichita, Kansas*, March 2012.
[52] *ibid.*
[53] CDM Smith, Inc, 20125, *NIC Site-Wide Vapor Assessment for the North Industrial Corridor, Site, Wichita, Kansas, May 2012*, approved August 2012.
[54] KDHE, 2012, *Final Corrective Action Decision for Interim Groundwater Remediation, North Industrial Corridor Site, Wichita, Kansas, March 2012* .
[55] *ibid.*
[56] ERM, 2014, *Feasibility Study Report, North Mosley site, Wichita, Kansas*, finalized and approved, April 2014.

applicable VI criteria.[57] Univar selected the US Occupational Safety and Health Administration (OSHA) workplace exposure values as one set of target values, since these values are more applicable for evaluating actual exposures at industrial sites, and compared those values to KDHE's Tier 2 [indoor air] screening values[58] as secondary indoor air target values.[59]

Comparing the VI screening results from the Univar FS to more recent Univar facility groundwater analytical data show that none of the recent site data exceeds VI screening criteria. After considering the VI evaluation activities at the Univar facility, along with the overall NIC VI assessment results, KDHE concluded that VI is not a potentially completed exposure pathway at this facility.[60]

## 4. Conceptual Site Model and Potential Exposure Pathways

A conceptual site model for the Univar facility was developed based on: 1) historical facility operations and property usage; 2) findings from the various RI activities conducted at the facility; and, 3) data from NIC-wide RI activities.

The RI data collected from the Univar facility were evaluated for potential exposure pathways. Univar may be an limited source area; however, groundwater impacts present throughout the NIC including the Univar facility have created potential exposure pathways.[61]

Contaminant concentrations in onsite groundwater exceed federal MCLs and could present an unacceptable risk posed if used for drinking, domestic, or other potable uses. However, future use of the groundwater underneath the site is restricted through City of Wichita Municipal Code of Ordinances, Title 7, Chapter 7.30, Section 7.30.105 which currently prohibits installing new wells and using pre-existing water wells for personal use in contaminated areas.[62]

The RSK Tier 2 screening levels provide a target for reducing onsite groundwater contaminant concentrations and preventing contaminants from migrating offsite. Tables 1 and 2 respectively summarize historic maximum and current contaminant concentrations in soil and groundwater, and the Kansas Tier 2 Levels or corresponding MCLs for the COCs where applicable.

In summary, while a formal Baseline Risk Assessment was not fully developed for the site, a conceptual risk evaluation shows that there are no unacceptable exposure risks under current use conditions for either soil or groundwater pathways. There is potential future exposure risk if the



[57] Secor International Incorporated, 2005, *Revised Remedial Investigation Report, Former Van Waters & Rogers Facility, Mosely Avenue Facility, Wichita, Kansas, North Mosley site, Wichita, Kansas*, March 2005.
[58] Risk-Based Standards for Kansas, RSK Manual, 5th Version, October 2010, Revised Appendix A March 2014
[59] *ibid.*
[60] ERM, 2014, *Feasibility Study Report, North Mosley site, Wichita, Kansas*, finalized and approved, April 2014
[61] *ibid.*
[62] KDHE, 2012, *Final Corrective Action Decision for Interim Groundwater Remediation, North Industrial Corridor Site, Wichita, Kansas*, March 2012.

groundwater contaminant concentrations rise above the VI assessment criteria or is used for domestic purposes in the future.

## 5. Remedial Action Objectives

Remedial Action Objectives (RAOs) are media-specific goals for protecting human health and the environment. RAOs are developed by evaluating applicable and relevant and appropriate requirements (ARARs) and To Be Considered standards along with the findings of the RI.

Based on administrative file information, site-specific RAOs include:

- Prevent human exposure via ingestion, inhalation, or dermal contact to contaminated soil and groundwater;
- Restore groundwater to allow for most beneficial use;
- Continue to monitor on-site groundwater contaminant concentrations while developing contingency actions in case of an increased threat to human health and the environment;
- Continue to monitor selected off-site groundwater monitoring wells and assessing possible impacts to the site;
- Address the potential for vapor intrusion as a completed future risk pathway in case groundwater VOC concentrations increase, and develop contingency actions to mitigate this threat.

## 6. Cleanup Levels

Federally promulgated MCLs are used as cleanup levels for groundwater remediation at sites with drinking water aquifers. Even though groundwater in the vicinity of the Univar facility is not currently used for potable purposes, it is a potential future source of drinking water. Therefore, MCLs (where available) are the final remedial cleanup levels. An alternate treatment goal (ATG) has been established for TCE in groundwater in the NIC site of 0.021 mg/L.[63] The NIC CAD allows for monitoring of sites with groundwater contamination between the MCL and ATG[64]. For those constituents where federal MCLs have not been established, KDHE's RSK Tier 2 screening levels are the final remedial cleanup levels.[65] For soil direct contact and soil to

[63] KDHE, 2012, *Final Corrective Action Decision for Interim Groundwater Remediation, North Industrial Corridor Site, Wichita, Kansas*, March 2012
[64] *ibid.*
[65] *Risk-Based Standards for Kansas, RSK Manual, 5th Version, October 2010*, Revised Appendix A March 2014.

groundwater migration pathways, KDHE's RSK Tier 2 screening criteria are the final remedial cleanup levels.

KDHE has calculated RSK Tier 2 screening levels for soil for the protection of human health and protection of groundwater. The RSK Tier 2 screening levels methods of calculation are identified in KDHE's RSK Manual (KDHE 2010). The Univar RI identified only minimal residual VOC soil impacts at concentrations above applicable RSK Tier 2 screening levels; the soil contamination does not appear to be acting as a continuous, ongoing source of groundwater contamination.

## 7. Summary of Remedial Alternatives Evaluated

Through the FS process, individual remedial action alternatives were first evaluated with respect to their ability to satisfy *National Oil and Hazardous Substances Contingency Plan*[66] (NCP) criteria and include: 1) protection of human health and the environment, 2) compliance with ARARs; 3) long-term effectiveness and permanence, 4) reduction of toxicity mobility or volume through treatment; 5) short-term effectiveness; 6) implementability; and, 7) cost. A more thorough description of each remedial action alternative and the individual and comparative analyses is presented in the FS.

Remedial alternatives were then compared against one another to facilitate the identification of the preferred alternative. A detailed description of the various remedial action alternatives and the individual and comparative analyses is presented in the FS.[67]

The NCP requires the evaluation of a No Action alternative to serve as a baseline for comparison to other remedial action alternatives evaluated.[68]

### 7.1 Remedial Alternatives Retained

Three remedial action alternatives were retained for detailed analysis. These include Alternative 1 – No Action; Alternative 2 – EUCs and Long-Term Groundwater Monitoring and Alternative 3 – Groundwater Extraction and Treatment.[69]



[66]September 15, 1994, *National Oil and Hazardous Substances Contingency Plan, Final Rule*, 59 FR 47384, 40 CFR 300 et seq.
[67] ERM, 2014, *Feasibility Study Report, North Mosley site, Wichita, Kansas*, finalized and approved, April 2014.
[68] September 15, 1994, *National Oil and Hazardous Substances Contingency Plan, Final Rule*, 59 FR 47384, 40 CFR 300 et seq.
[69] ERM, 2014, *Feasibility Study Report, North Mosley site, Wichita, Kansas, finalized and approved, April 2014*

### 7.1.1 Alternative 1 – No Action

The No Action alternative is included for comparison, as a baseline to other potential response action alternatives. Typically, the No Action alternative means the site is left unchanged; no specific, direct, or indirect response action is taken to address the identified impacts; and there is no associated process option.

The No Action alternative does not address risks posed by groundwater through vapor intrusion.[70] Therefore, the protection of human health criterion is not achieved.[71] The No Action alternative also does not address the risks posed by groundwater to the environment. Therefore, protection of the environment is not achieved. If VOC concentrations become elevated this alternative does not take into account the change in potential for exposure pathways to be completed.[72]

The No Action alternative generally does not comply with several of the ARARs identified in the FS.[73] Certain other ARARs would not be applicable since groundwater is not being treated, wells are not being installed, and permits are not necessary, etc.[74] Overall this alternative does not meet the compliance with ARARs criterion.

The No Action alternative was rated as having a high level of technical implementability and feasibility since it obviously does not involve any response and can therefore be easily implemented. The effectiveness and cost for this alternative were both rated as 'none' as a "no response" would not be effective and would have no short-term or long-term cost associated with it. There is no estimated time to completion for this alternative since "no action" assumes no control of on-site contaminants and/or efforts to monitor and respond to off-site contaminants migrating on-site.

The present value cost of Alternative 1 is $ 0.00 USD.

### 7.1.2 Alternative 2 – EUCs & Long-Term Groundwater Monitoring

The EUC and Long-Term Groundwater Monitoring remedial alternative would provide long term legal control over the types of land use and subsurface activities that occur at the site while continuing to monitor groundwater quality. This alternative does not actively reduce contaminant concentrations, toxicity and/or mobility in groundwater, though the long term stewardship of the

[70] ERM, 2014, *Feasibility Study Report, North Mosley site, Wichita, Kansas, finalized and approved, April 2014*
[71] *ibid.*
[72] ibid.
[73] *ibid.*
[74] *ibid.*

site is assured through a legally-binding instrument and commitment to groundwater monitoring, with suitably protective contingency actions.

EUCs and long-term groundwater monitoring generally meet the ARARs identified in the FS; however, some ARARs are not applicable since groundwater is not being treated and no wells are being installed, and installation permits are not necessary. However, with the enforcement of institutional controls (EUC and city code), usage of groundwater at this site would be restricted.[75] Overall this alternative is considered to meet applicable ARARs criterion.

The EUC and long-term groundwater monitoring alternative is protective of human health and the environment by preventing current and potential future environmental exposures at the site. Currently VOC concentrations in groundwater do not exceed vapor intrusion criteria.[76] Groundwater quality will be monitored to verify that these conditions do not change over time while implementation documentation will establish suitably protective contingency action should the monitoring identify a change in risk characterization at the site.

The EUC and long term monitoring alternative can be readily implemented. Given the extensive network of current onsite monitoring wells, the network of NIC offsite monitoring wells, and the relative ease of installation of additional wells should they become necessary, implementability is considered high. In addition, administrative feasibility is simple as no permits and limited local approvals are necessary.[77]

In addition to monitoring groundwater quality and changes in VOC concentrations over time, this alternative would involve collecting specific groundwater quality data evaluating anaerobic degradation conditions (Monitored Natural Attenuation – MNA) and other biotic and abiotic degradation pathways. MNA parameters may include field collected and/or analytical laboratory data. These field parameters include: oxygen content, oxidation-reduction potential, conductivity, pH, temperature, and others while laboratory parameters can include total organic carbon, sulfate, nitrate, chloride, iron, multiple organic acids, and alkalinity, as well as dissolved gases such as ethene, ethane, hydrogen, and methane.

The present value cost of Alternative 2, estimating a 20 year completion cycle but not including contingency implementation, is $327,000.[78]

### 7.1.3 Alternative 3 – Groundwater Extraction and Treatment

Alternative 3 involves capturing and extracting impacted groundwater from one or more recovery wells, treating the groundwater removing contaminants and then discharging the treated

[75] ERM, 2014, *Feasibility Study Report, North Mosley site, Wichita, Kansas*, finalized and approved, April 2014.
[76] *Risk-Based Standards for Kansas, RSK Manual, 5th Version, October 2010*, Revised Appendix A March 2014.
[77] ERM, 2014, *Feasibility Study Report, North Mosley site, Wichita, Kansas*, finalized and approved, April 2014
[78] *ibid.*

water.[79] Alternative 3 is implemented by installing an extraction well or wells to capture the impacted groundwater. Once captured, the groundwater is then treated by either an onsite treatment system or discharged directly to the local wastewater treatment plant for treatment.[80]

The groundwater extraction and treatment alternative generally meet the ARARs identified in the FS. Overall, this alternative is considered to meet ARARs as identified in the FS.[81]

The groundwater extraction and treatment alternative is protective of human health and the environment in that it can prevent the further migration of impacted groundwater beyond a certain point of compliance or from a source area to other areas not already impacted. In this manner Alternative 3 is protective of human health and the environment.

The groundwater extraction and treatment alternative can readily be implemented with regards to technological requirements. Groundwater extraction for domestic or municipal water supply systems or remediation systems is relatively common and it would not be difficult to obtain the required equipment and personnel. Building an onsite treatment system or a forced main water line to deliver captured groundwater to an offsite treatment system is generally not difficult, although expensive.[82] Implementing this alternative is not as straight-forward because permits and approvals will be required from multiple state and local agencies. However, overall the groundwater extraction and treatment alternative is considered to meet implementability requirements and receives a moderate rating for achieving this particular criterion.

Groundwater extraction and treatment is an alternative that generally meets several of the screening criteria given the site-specific conditions at the Univar facility. A primary drawback of this alternative is the pervasive groundwater impacts in the NIC and the potential to draw groundwater to the Univar facility which is already impacted (or more impacted) than groundwater already present at the facility. In addition, the overall cost and resource usage for this alternative does not generally reduce the time required to complete remediation when compared to other less resource consumptive technologies.

The present value cost of Alternative 3, estimating 30 years of operation, is $3,505,000.

## 8. Description of the Preferred Remedy

Based on evaluating and screening individual remedial action alternatives, the overall locational context of the site within the NIC, and the Univar facility history, and considering the threshold

[79] ERM, 2014, *Feasibility Study Report, North Mosley site, Wichita, Kansas*, finalized and approved, April 2014
[80] *ibid.*
[81] *ibid.*
[82] *ibid.*

and balancing criteria specified in the NCP[83], KDHE has selected Alternative 2, consisting of an EUC and long term groundwater monitoring, as the Agency's preferred remedial alternative.[84] This selection is supported in part by and is consistent with the overall NIC strategy for the various groundwater units as identified in the Final Corrective Action Decision, North Industrial Corridor Site, Wichita, Kansas.[85] The Univar facility, which is centrally located within the NIC, may have contributed only limited releases to groundwater, so any contamination that may migrate off-site would be addressed by the overall NIC remedial alternative(s). Additionally, NIC groundwater data show that contaminant concentrations onsite are likely due to contaminants migrating from upgradient sources.

The Univar EUC and long term monitoring alternative has a moderate to high ability to meet the various NCP screening criteria. Although Alternative 2 does not involve active groundwater treatment or containment, the alternative does reduce contaminants in the groundwater over time through natural processes and monitoring will document these changes. Should VOC concentrations increase in groundwater, the monitoring data can be used to further evaluate exposure pathways. The preferred remedy as outlined above satisfies Federal, State, and local requirements, and is protective of human health and the environment.

## 9. Community Involvement

A Public Relations Strategy for the Univar Mosley Avenue Facility was developed by KDHE. Public input and comment has been encouraged by KDHE throughout the process. Public notice of the availability of the draft CAD will be published in *The Wichita Eagle.* In addition, KDHE has established a webpage dedicated to the Univar Site available online at http://www.kdheks.gov/remedial/site_restoration/van_waters.html. Many site documents, including this draft CAD, are available on the webpage.

The public is encouraged to review and comment on the preferred remedy presented in this draft CAD. As per the Public Relations Strategy, KDHE will hold a public availability session and hearing during the public comment period to present information regarding the preferred remedy and solicit public participation. Notice of the public availability session/hearing will be published in *The Wichita Eagle* and posted on KDHE's Van Waters & Rogers webpage.

The public may provide comments on the draft CAD during the 45-day public comment period. Public comments on the draft CAD may be submitted to KDHE during the public hearing or in writing during the 45-day public comment period.



[83] September 15, 1994, *National Oil and Hazardous Substances Contingency Plan, Final Rule,* 59 FR 47384, 40 CFR 300 et seq.
[84] ERM, 2014, *Feasibility Study Report, North Mosley site, Wichita, Kansas*, finalized and approved, April 2014.
[85] KDHE, 2012, *Final Corrective Action Decision for Interim Groundwater Remediation, North Industrial Corridor Site, Wichita, Kansas*, March 2012.

Written comments must be postmarked by August 15, 2014 and mailed to the name and address specified below:

Kansas Department of Health and Environment
Bureau of Environmental Remediation
1000 SW Jackson Street; Suite 410
Topeka, Kansas 66612-1367

Contact: John K. Cook, PG
Phone: 785-296-8986

Comments on the draft CAD may also be submitted to KDHE by electronic mail to johncook@kdheks.gov. Comments sent by electronic mail must be received by KDHE by 5:00 p.m. on August 15, 2014.

KDHE will select a final remedy after reviewing and considering all information submitted during the 45-day public comment period. KDHE may modify the preferred remedy based on new information or public comments. All comments that are received by KDHE prior to the end of the public comment period will be addressed by KDHE in the Responsiveness Summary Section of the Final CAD.

# TABLES

Kansas Department of Health and Environment
Environmental Remediation

## Table 1 – Maximum Contaminant Concentrations in Soil

| Contaminant of Concern | Residential Tier 2 Level* (Soil Pathway) (mg/kg) | Residential Tier 2 Level* (Soil to Groundwater Protection Pathway) (mg/kg) | Maximum Detected Concentration (mg/kg) |
|---|---|---|---|
| **Trichloroethylene** | 5.85 | 0.0842 | **0.150** |
| **Methylene chloride** | 312 | 0.0429 | **.0055** |
| **Vinyl chloride** | 4.47 | 0.0205 | **ND** |
| **Perchloroethylene**** | 109 | 0.121 | **ND** |

**KDHE's Risk-based Standards for Kansas (RSK) Manual, October, 2010 (revised Appendix A March 2014)*
***also known as Tetrachloroethylene*
*Red Font indicates concentration exceeds Tier 2 RSK Level*
*mg/kg = milligrams per kilogram*
*ND = not detected above analytical detection limits*

## Table 2 – Contaminant Concentrations in Groundwater

| Contaminant of Concern | Residential Tier 2 Level* (Groundwater Pathway) (µg/L) | Historic Maximum Concentration Detected (µg/L) *** | Current Maximum Concentration Detected (µg/L)**** |
|---|---|---|---|
| **Benzene** | 5 | **1.2** | **ND** |
| **1,1-Dichloroethane** | 25 | **10** | **2.2** |
| **1,1-Dichloroethylene** | 7 | **55** | **ND** |
| **Cis-1,2-Dichloroethylene** | 70 | **180** | **16.6** |
| **Trans-1,2-Dichloroethylene** | 100 | **3.4** | **1.5** |
| **Perchloroethylene**** | 5 | **8.8** | **1.5** |
| **1,1,1-Trichlorothane** | 200 | **2.9** | **ND** |
| **Trichloroethylene** | 5 | **760** | **23.1** |
| **Vinyl Chloride** | 2 | **96** | **5.1** |

**KDHE's Risk-based Standards for Kansas (RSK) Manual, October, 2010 (revised Appendix A March 2014)*
***also known as Tetrachloroethylene*
****late1990s/early 2000s*
***** Year 2013 sampling*
*Red Font indicates concentration exceeds Tier 2 RSK Level*
*µg/L = micro-grams per liter*
*ND = not detected above analytical detection limits*

## Table 3 - Cleanup Levels for Groundwater Remediation for Target Groundwater Compounds

| Compound | MCL or KDHE Tier 2 Level‡* | Alternate Treatment Goal (for NIC Sites) |
|---|---|---|
| **PCE** | 0.005 | NE** |
| **TCE** | 0.005 | 0.021 |
| **Vinyl chloride** | 0.002 | NE** |

*‡KDHE Tier 2 Levels default to MCLs where available. Tier 2 Level for groundwater provided from KDHE's Risk-based Standards for Kansas (RSK) Manual, October, 2010.*
** Milligrams per Liter (mg/L)*
*** Not Established*

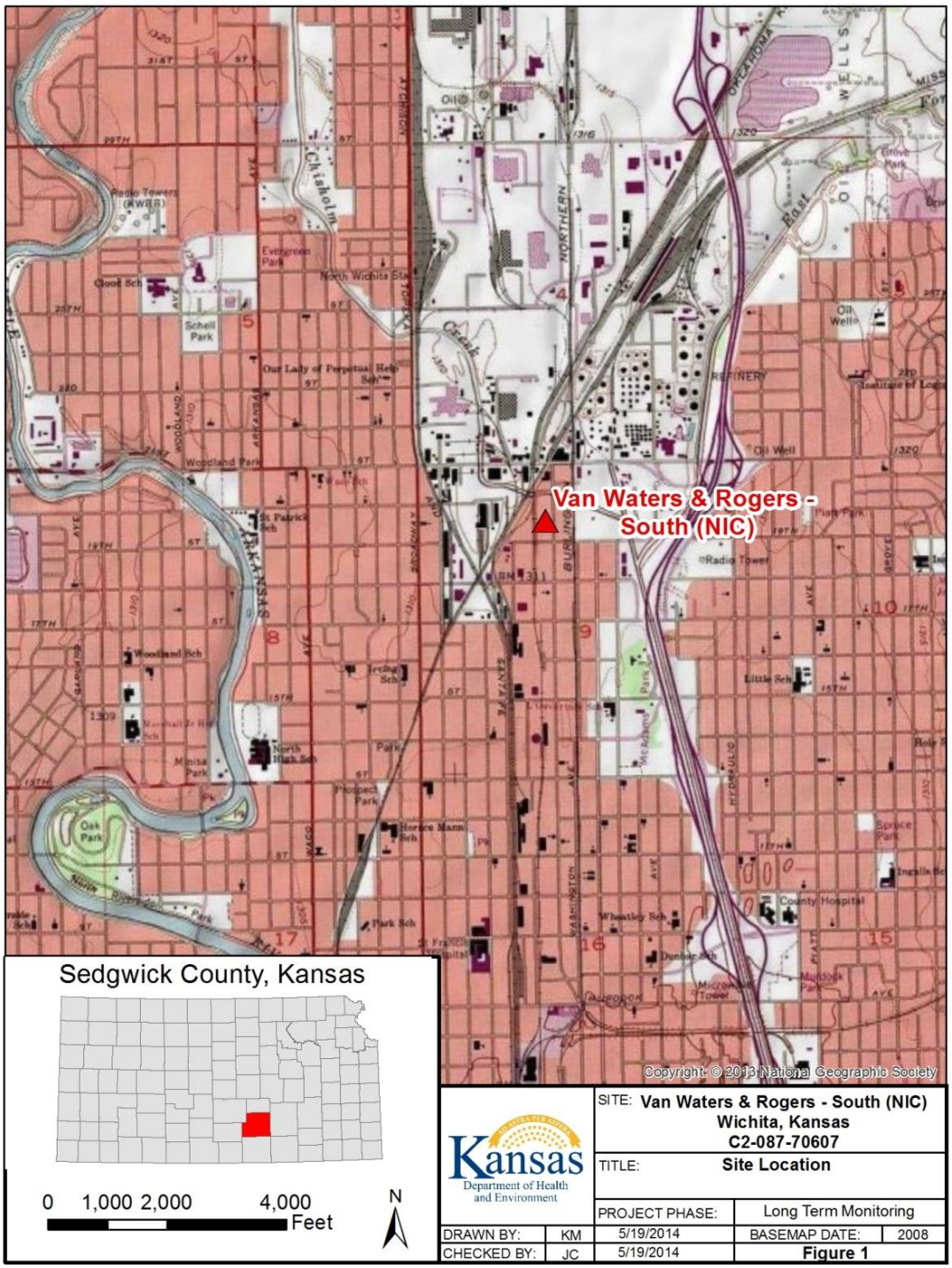
**Table 4 – Estimated Cost of the Alternatives**

| Alternative | Total Capital Cost | Total O&M Cost | Total Periodic Cost | Present Value Cost* |
|---|---|---|---|---|
| No. 1 - No Action | $0.00 | $0.00 | $0.00 | $0.00 |
| No. 2 - Environmental Use Controls and Long-Term Monitoring | $10,000*** | $0.00 | $317,400 | $327,400 |
| No. 3 - Groundwater Extraction and Treatment** | $935,000 | $2,160,000 | $410,000 | $3,505,000 |

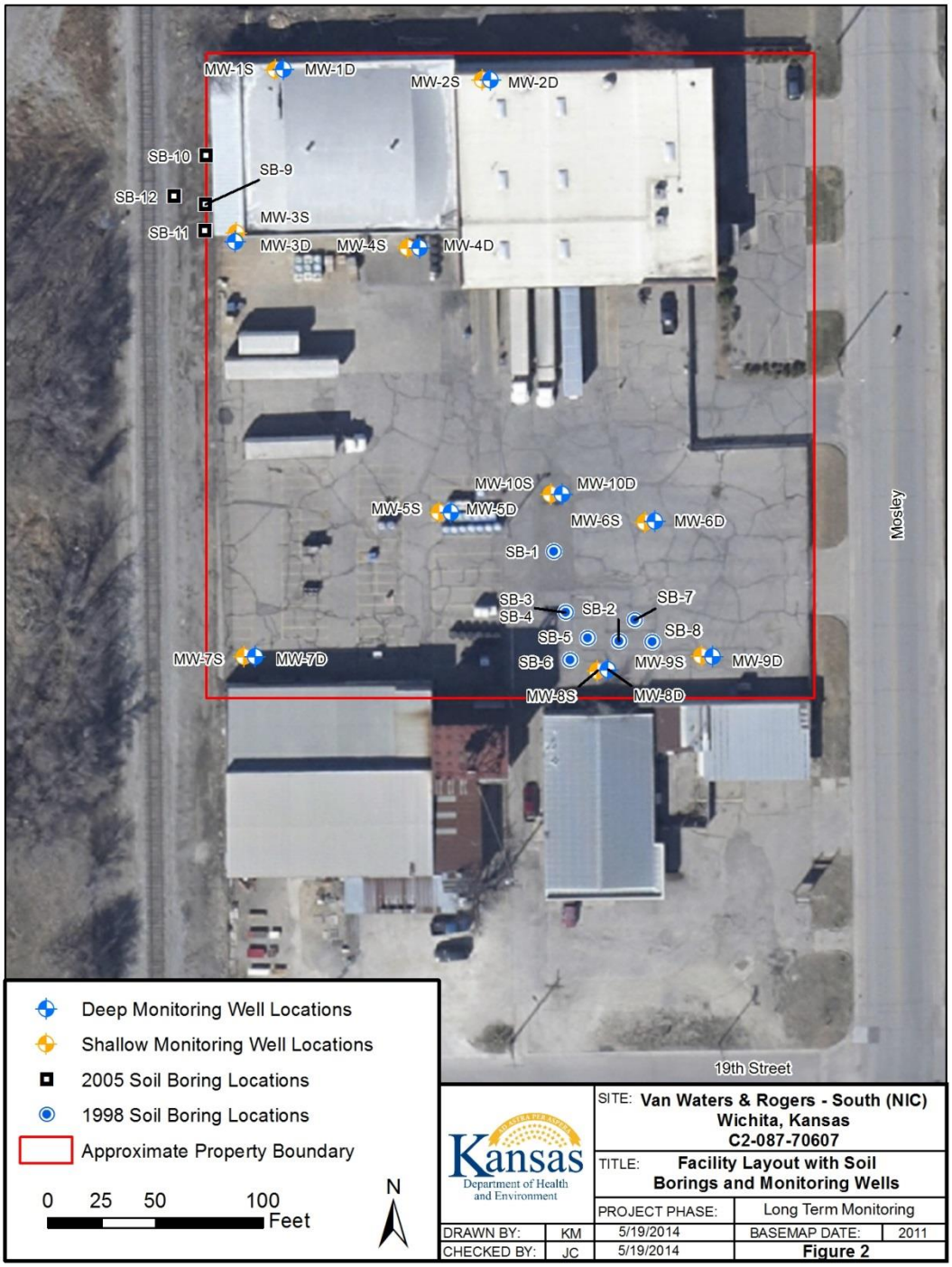
** Costs estimated by Environmental Resources Management; Costs presented in the table above do not include source abatement activities or contingency implementation and may not include all necessary pre-design data acquisition activities. Actual costs for site-wide remedial actions are expected to be within the -30% to +50% range as specified in the National Oil and Hazardous Substances Pollution Contingency Plan.*
***On-Site Treatment*
****The cost of an EUC is based upon the property size, contaminant mobility/toxicity, maintenance requirements, and inspection frequency. KDHE will either request a one-time payment that will not exceed $10,000, or a long-term care agreement will be negotiated to provide the funding necessary for maintaining the EUC.*

# FIGURES

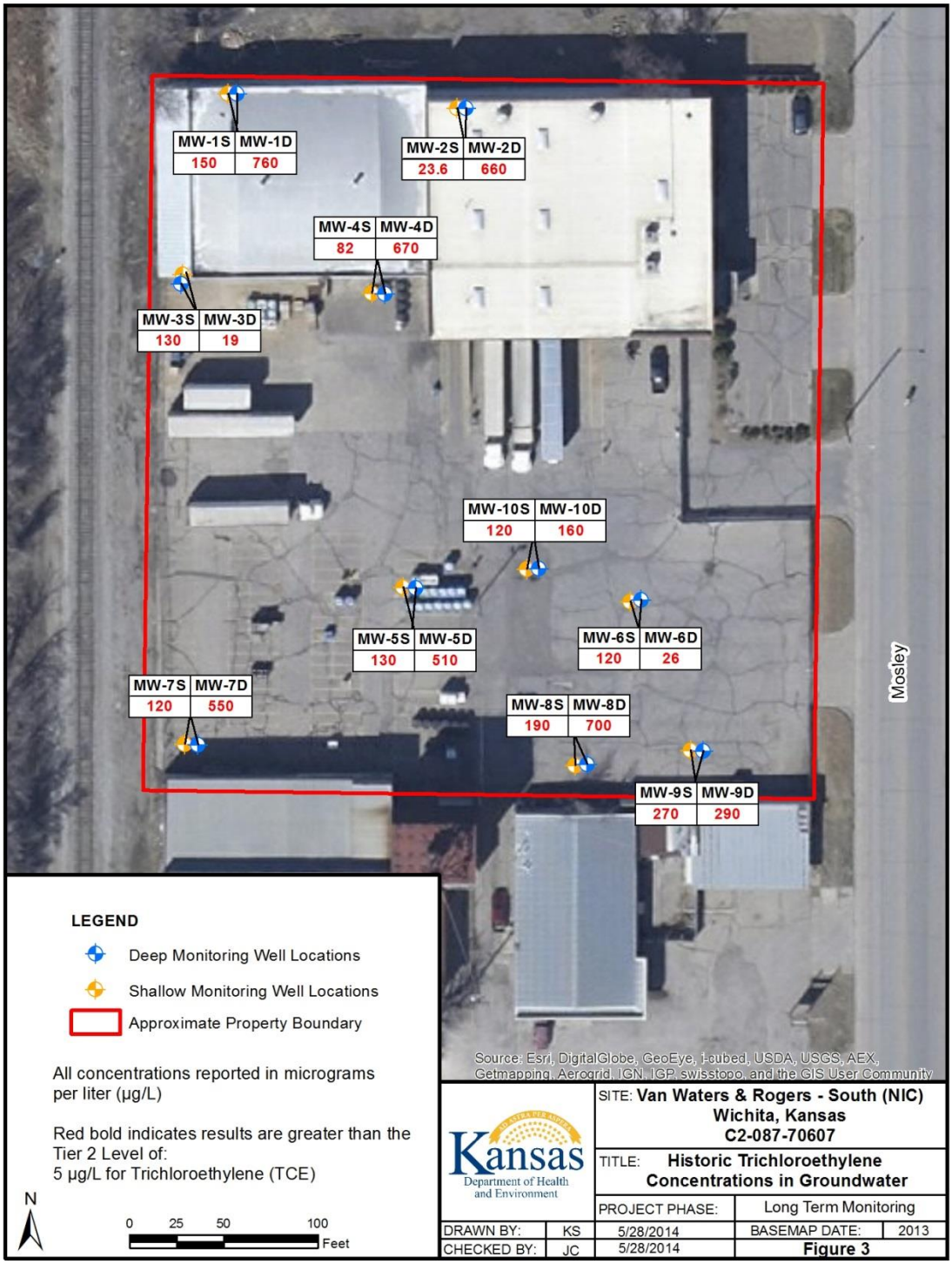
## Figure 1 – Site Location Map



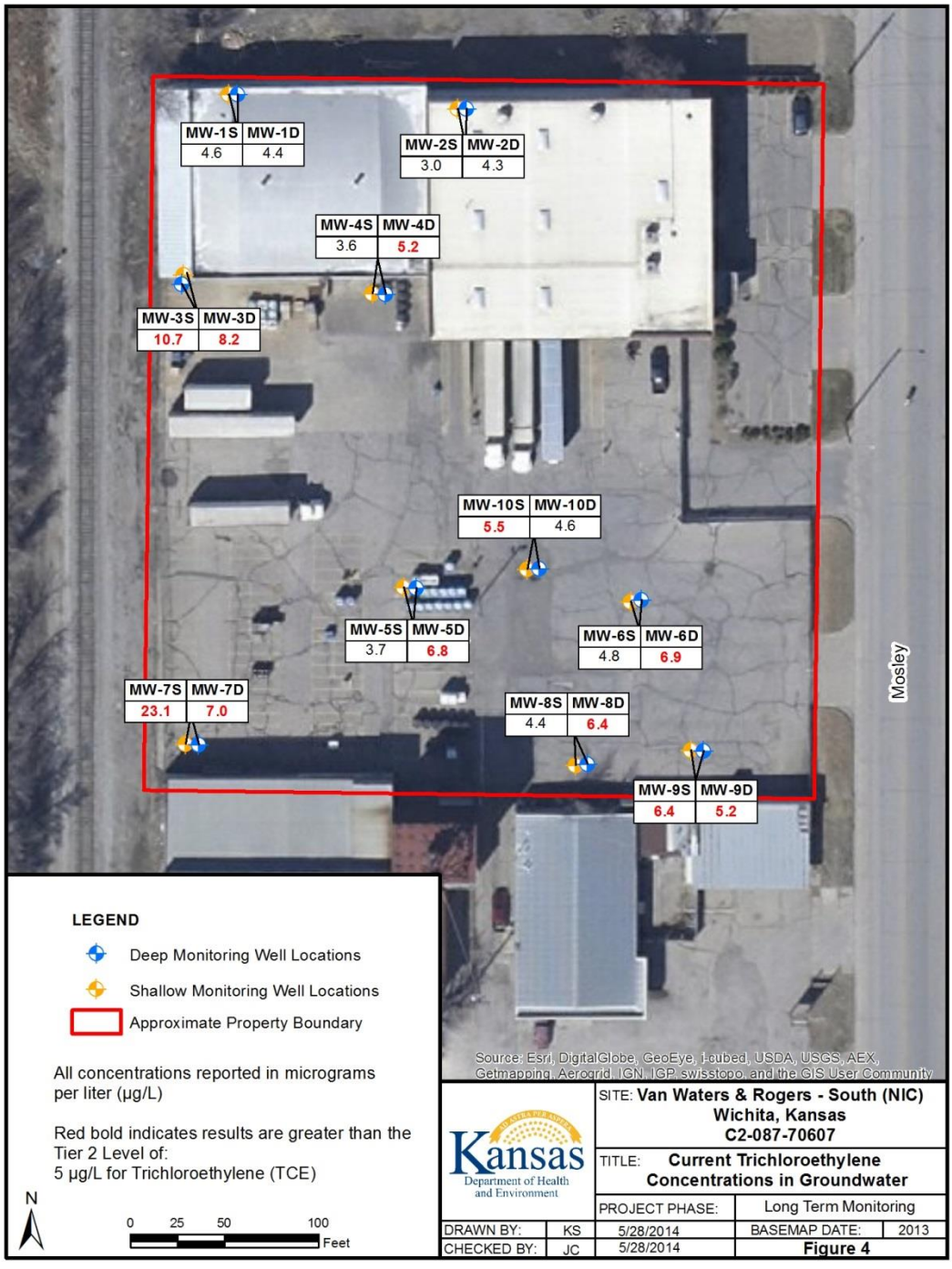
## Figure 2 – Site Map with Current Layout



## Figure 3 – Historic TCE in Groundwater



## Figure 4 – Current TCE in Groundwater



## Figure 5 – Known or Suspected Groundwater Source Areas, NIC

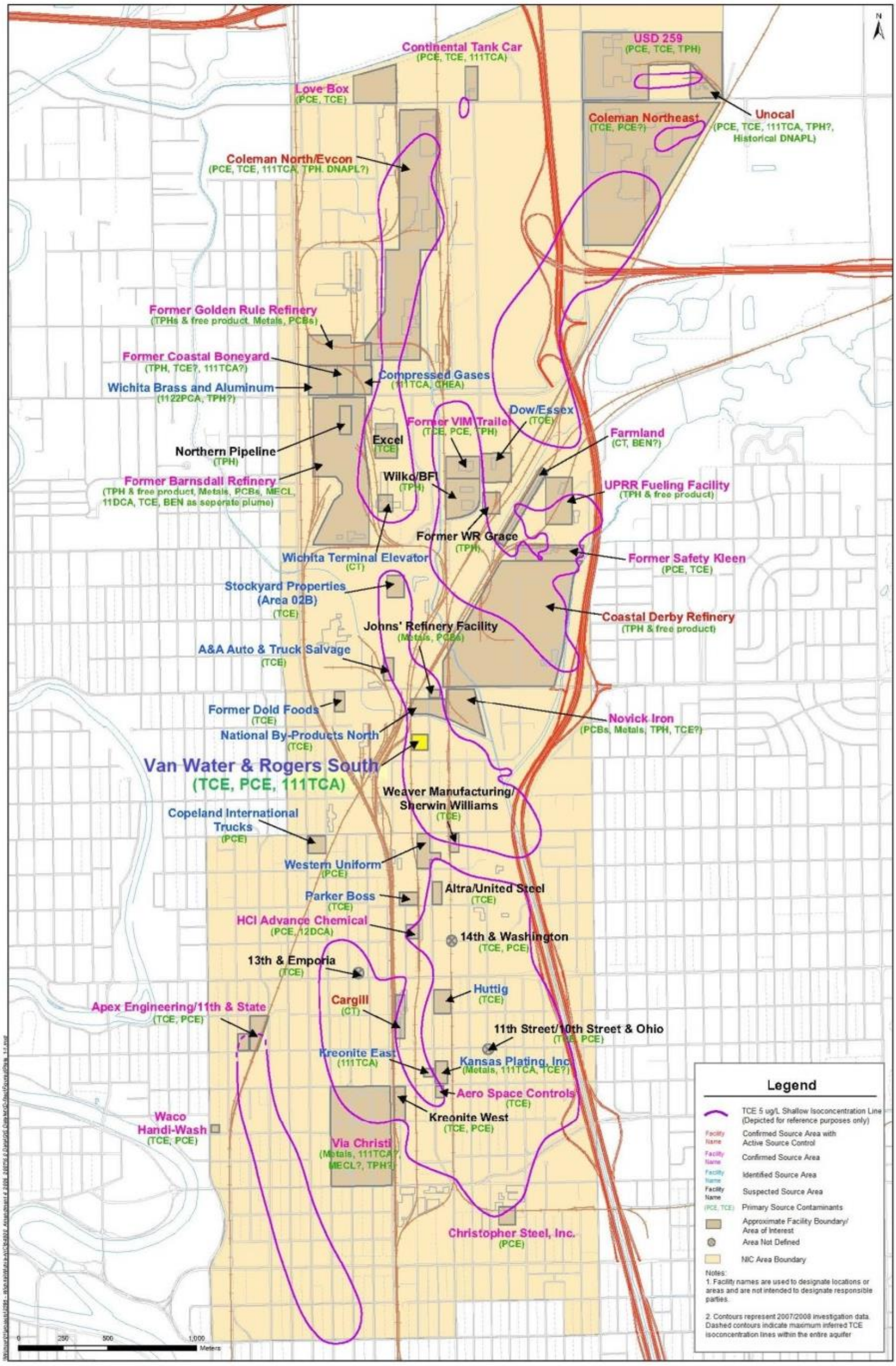



*Figure prepared by Camp Dresser & McKee Inc. on behalf of the City of Wichita based on Plate 1-1 from the Site-Wide Feasibility Study, June 2011.*